SRA-M12-316 STAINLESS STEEL WEDGE ANCHOR

Independent Laboratory Test Summary

Mean Ultimate Tension: **26.17 kN**
Maximum Observed Load: **34.75 kN**
Mean Shear Capacity: **50.70 kN**
Concrete Strength During Testing: **27.5 – 30 MPa**
Testing conducted by **Melbourne Testing Services (ISO/IEC 17025 Accredited Laboratory).**

Verified Anchor System Application

SRA AA408 Dual Fix Anchor
Tested in accordance with AS/NZS 5532:2025
Rated rope access/ fall-arrest anchorage device: 15 kN

Product Description

The SRA-M12-316 is a post-installed mechanical wedge anchor manufactured from **A4 (316) stainless steel** for installation into reinforced concrete substrates.

The anchor is designed for structural fastening applications including safety systems, structural attachments, and engineered anchorage installations where corrosion resistance and reliable load performance are required.

Independent mechanical testing has been conducted to verify the tensile and shear performance of the anchor when installed in reinforced concrete.

The anchor plate features a **raised eye connection** allowing 360° load orientation.

Key Features

- Manufactured from 316 stainless steel for superior corrosion resistance
- Suitable for external and coastal environments
- Designed for installation in reinforced concrete substrates
- Reliable expansion mechanism for consistent load transfer
- Independently tested mechanical performance
- Suitable for structural and safety-related anchorage applications

Typical Applications

Typical applications include:

- Roof safety anchor systems
- Structural steel attachments
- Mechanical equipment fixing
- Safety line installations
- General structural fastening in reinforced concrete

Product Specifications

Parameter	Specification
Anchor Type	Mechanical wedge anchor
Diameter	M12
Overall Length	125 mm
Thread Size	M12 × 1.75
Material	316 Stainless Steel
Maximum Fixture Thickness	10 mm
Minimum Effective Embedment	95 mm
Installation Torque	50 Nm

Installation Requirements

For optimum performance, anchors must be installed in accordance with the following requirements:

- Drill hole perpendicular to the concrete surface
- Drill hole diameter: **12 mm**
- Hole depth: **100 mm**
- Clean hole using **brush and compressed air** to remove debris
- Insert anchor through fixture and tap into place until washer is seated
- Tighten anchor nut to **50 Nm installation torque**

Correct installation is essential to achieve the performance values presented in this document.

Substrate Requirements

Performance values in this document are based on installation in reinforced concrete with the following characteristics:

Minimum concrete strength: **27.5 – 30 MPa**
Minimum base material thickness: **150 mm**

Recommended installation geometry:

Minimum edge distance: **150 mm**
Minimum anchor spacing: **200 mm**

Anchors installed closer than these distances may experience reduced capacity and should be assessed by a competent person.

Independent Mechanical Testing

Mechanical performance testing of the SRA-M12-316 anchors was conducted by **Melbourne Testing Services**, an **ISO/IEC 17025 accredited laboratory**, using reinforced concrete slabs with compressive strengths between **27.5 MPa and 30 MPa**.

Testing included:
• Basic tension loading
• Tension loading with edge effects
• Shear loading

Failure during testing occurred primarily by **anchor withdrawal**, with no concrete breakout observed in basic tension testing.

Ultimate Test Results
(Laboratory Measurements)

The following results represent **ultimate loads measured during laboratory testing of single anchors.**

These values represent the load at which failure occurred during testing and are **not design loads.**

Test Type	Peak Load Range	Mean Ultimate Load
Basic Tension	18.78 – 34.75 kN	26.17 kN
Tension with Edge Effects	25.79 – 41.45 kN	31.89 kN
Shear	45.84 – 57.32 kN	50.70 kN

These results demonstrate consistent mechanical performance across multiple specimens and loading conditions.

Engineering design loads may be derived from these results using appropriate safety factors depending on installation conditions and applicable standards.

Capacity Hierarchy (Illustrative)

Ultimate Capacity
26 kN

Characteristic Resistance
18.6 kN

Typical Derived Allowable Load
6–9 kN

Characteristic Resistance

Based on the laboratory test results, a **characteristic tensile resistance (Nk)** can be derived using statistical evaluation of the measured data.

Characteristic resistance represents a conservative estimate of anchor capacity that accounts for variability between test specimens and corresponds to a value that at least **95% of anchors are expected to exceed.**

Parameter	Value
Mean ultimate tension	26.17 kN
Standard deviation	4.58 kN
Derived characteristic resistance (Nk)	≈ 18.6 kN

Characteristic resistance values provide a suitable basis for engineering design when applying appropriate safety factors.

Dual Anchor System Behaviour

When two anchors are installed in a **dual-fix configuration with approximately 200 mm spacing, as used in the SRA AA408 anchor system**, the anchors act together through the anchor plate to distribute applied loads to the concrete substrate.

Based on laboratory test results, two anchors provide a combined **ultimate tensile capacity exceeding 50 kN** (based on mean ultimate test results).

The load capacity of dual-anchor systems will depend on:

- anchor spacing
- edge distances
- concrete strength
- load distribution through the anchor plate
- applicable engineering safety factors

In typical anchor plate configurations the applied load is distributed between the two anchors through the anchor plate, providing **increased system capacity and redundancy** within the anchorage assembly.

Engineering Design Guidance

Engineering design loads for anchors installed in reinforced concrete are typically derived from ultimate test results by applying appropriate safety factors that account for:

- concrete cracking
- installation tolerances
- load variability
- structural safety factors required by applicable standards

Typical derived allowable tensile load (single anchor):
≈ 6 – 9 kN

Actual allowable loads should be determined by a competent engineer based on the specific installation conditions and applicable design standards.

Corrosion Resistance

The SRA-M12-316 anchor is manufactured from **A4-grade (316) stainless steel**, providing excellent corrosion resistance.

This material is suitable for:

- external installations
- coastal environments
- humid or wet conditions

Periodic inspection is recommended for installations in aggressive environments.

Reuse Policy

Mechanical wedge anchors are single-use structural fasteners. Anchors must not be removed and reused, as removal may compromise the expansion mechanism and load capacity.

Important Notes

Performance values presented in this document are based on laboratory testing and assume:

- correct installation
- suitable concrete substrate
- compliance with installation requirements

Actual performance may vary depending on substrate conditions, installation quality, and loading configuration.

Engineering judgement should be applied when anchors are used outside the conditions described in this document.

System Verification

The **AA408 dual-fix anchor system** has been independently tested by **Melbourne Testing Services** in accordance with **AS/NZS 5532:2025.**

Testing included:

- Dynamic fall-arrest drop testing using a **100 kg mass dropped from 2 m**
- Static proof loading to **15 kN for 3 minutes**

The AA408 anchor successfully passed the required dynamic and static performance criteria in all tested orientations, verifying compliance with the performance requirements for a **15 kN rated rope access/ fall-arrest anchorage device.**